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Witkowski et al.

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(45) **Date of Patent: Mar. 22, 2011**

(54) **ELECTRONIC DEVICE AND REMOTE COMPUTER SYSTEM AND METHOD FOR CONTROLLING REMOTE COMMUNICATIONS**

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(73) Assignee: **Guard Insurance Group**, Wilkes-Barre, PA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 17 days.

(21) Appl. No.: **12/550,963**

(22) Filed: **Aug. 31, 2009**

(65) **Prior Publication Data**

US 2010/0049853 A1 Feb. 25, 2010

Related U.S. Application Data

(63) Continuation of application No. 12/255,319, filed on Oct. 21, 2008, now Pat. No. 7,590,744, which is a continuation-in-part of application No. 10/905,102, filed on Dec. 15, 2004, now abandoned.

(51) **Int. Cl.**
G06F 15/16 (2006.01)
G06F 12/00 (2006.01)

(52) **U.S. Cl.** **709/227**; 709/232

(58) **Field of Classification Search** 709/217–219, 709/227–229, 232, 250
See application file for complete search history.

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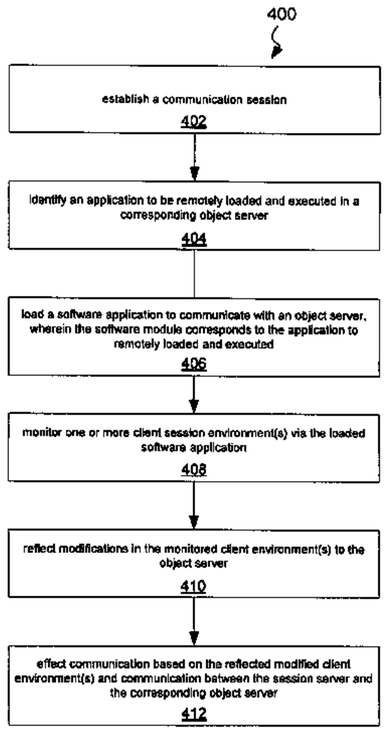
Primary Examiner — Zarni Maung
(74) *Attorney, Agent, or Firm* — IP Authority, LLC; Ramraj Soundararajan

(57) **ABSTRACT**

A remote communication system and method are disclosed. An environment is identified defining a plurality of parameters communicated between an electronic device (or a computer-based device) and a remote computer as part of a remote session (i.e., the electronic device remotely controlling the remote computer via the remote session), with each parameter defining an action associated with the remote session. A first application (associated with the electronic device), via a unidirectional communication with the environment, modifies at least one parameter associated with the environment (e.g., modifying keyboard scan codes, cursor position, mouse position, clipboard data, screen resolution, or channel administration), wherein the modified parameter is extracted by an interceptor associated with the remote computer and, the interceptor, based on a look-up, executes a pre-defined action affecting the remote session, wherein the pre-defined action being different than the modified parameter's associated action.

29 Claims, 18 Drawing Sheets



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JP	2003-30383	1/2003
JP	2003-39767	2/2003

* cited by examiner

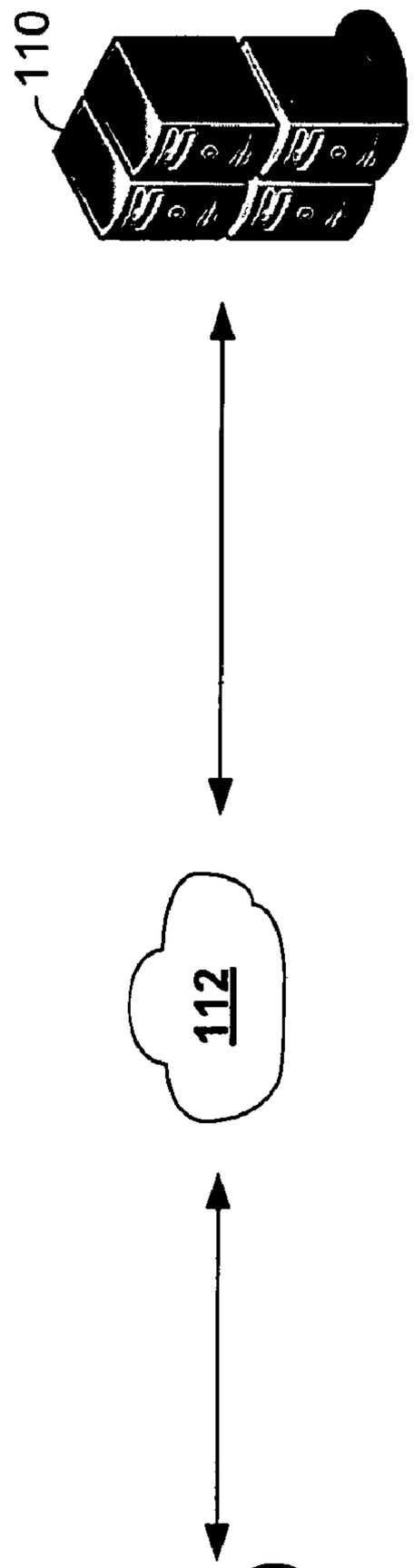
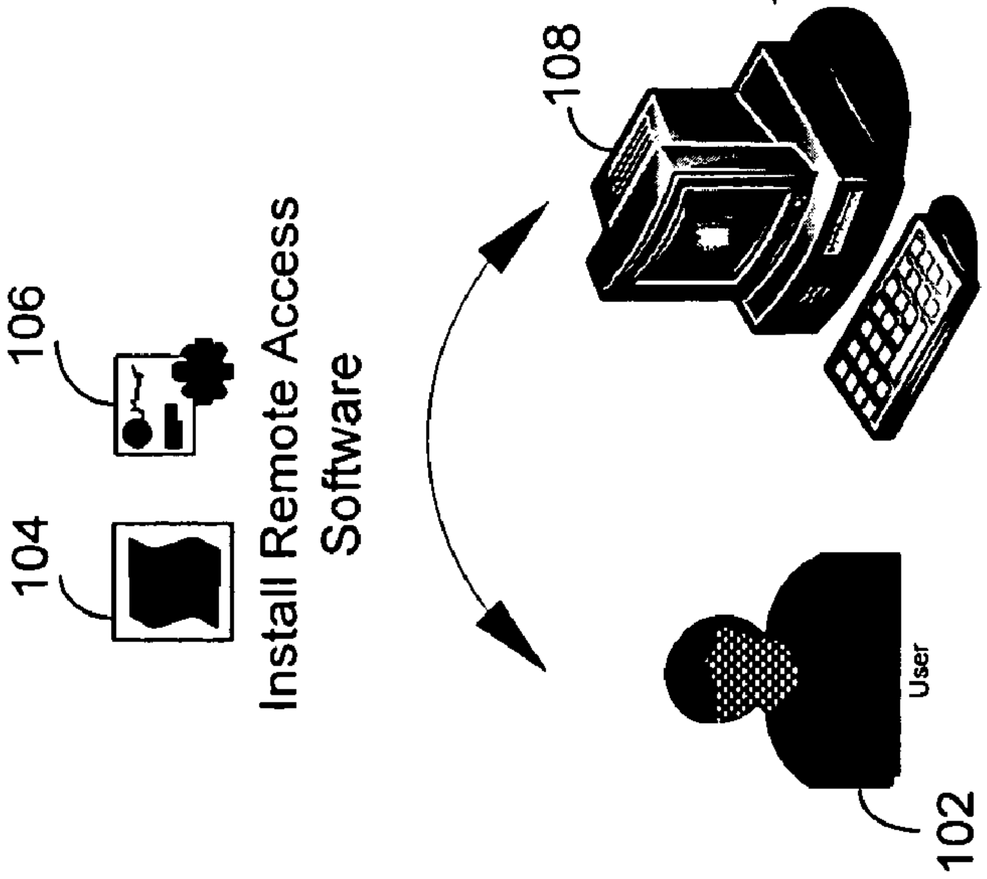


FIG. 1a
(PRIOR ART)



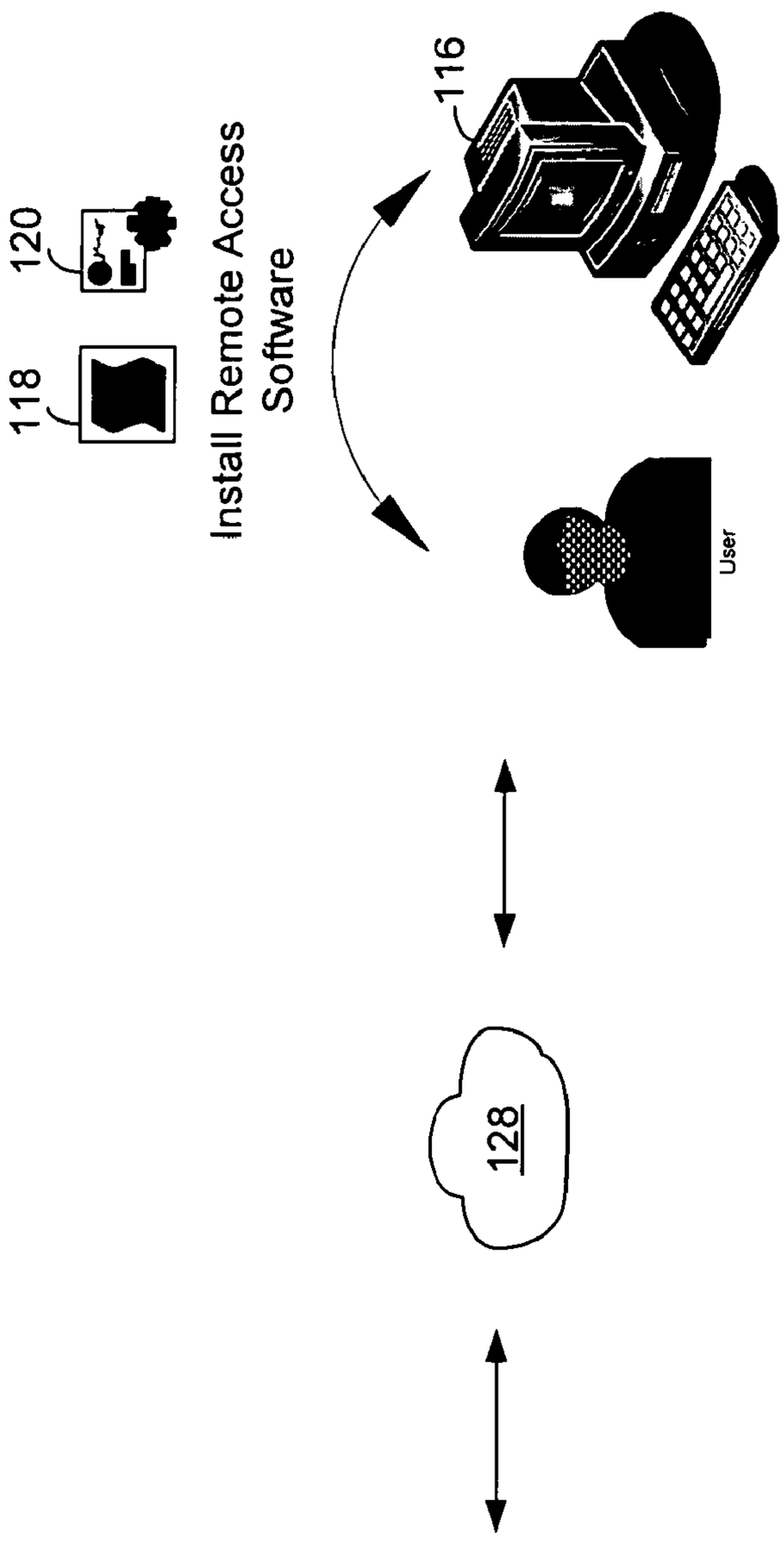


FIG. 1b
(PRIOR ART)

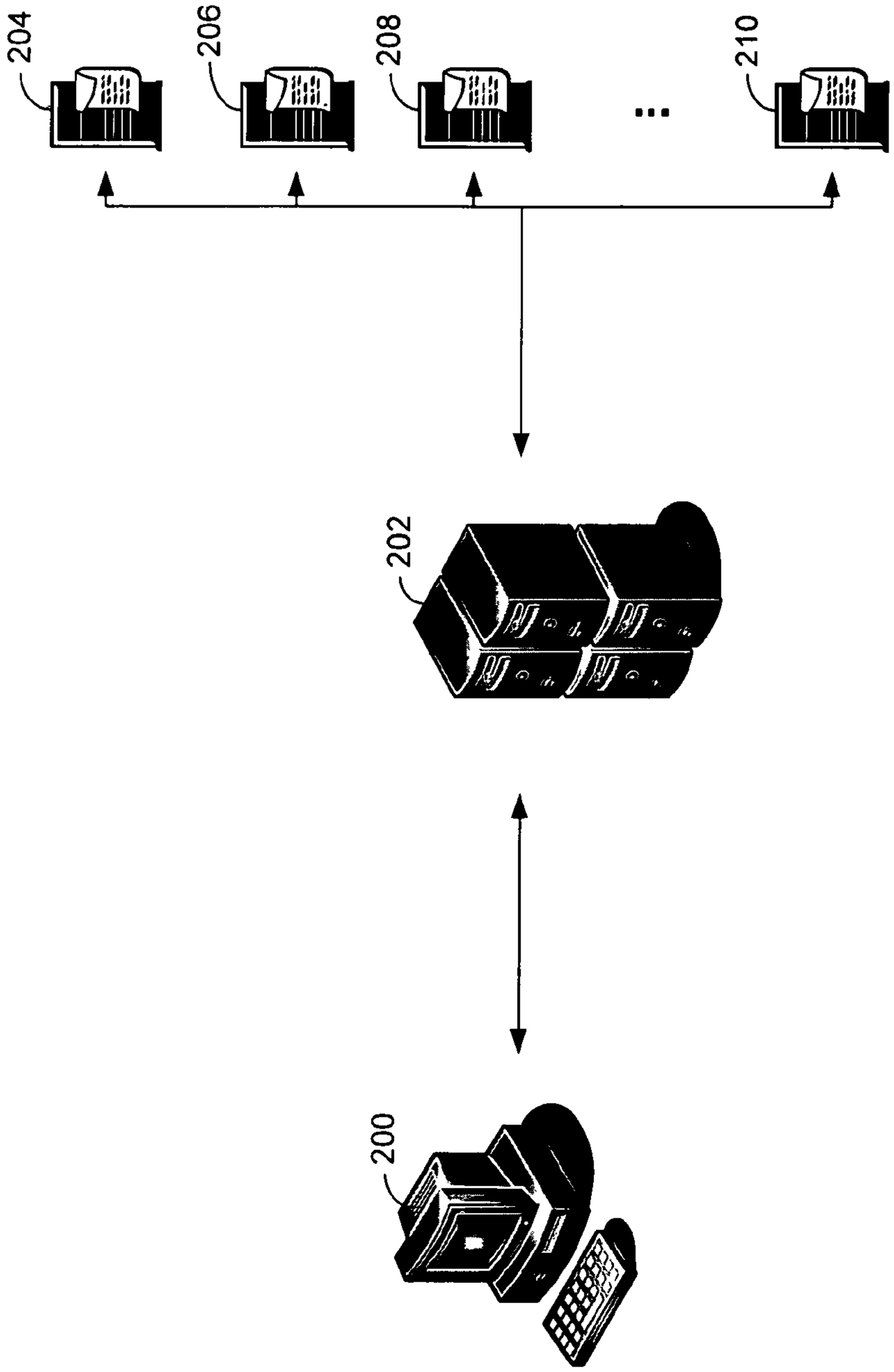


FIG. 2

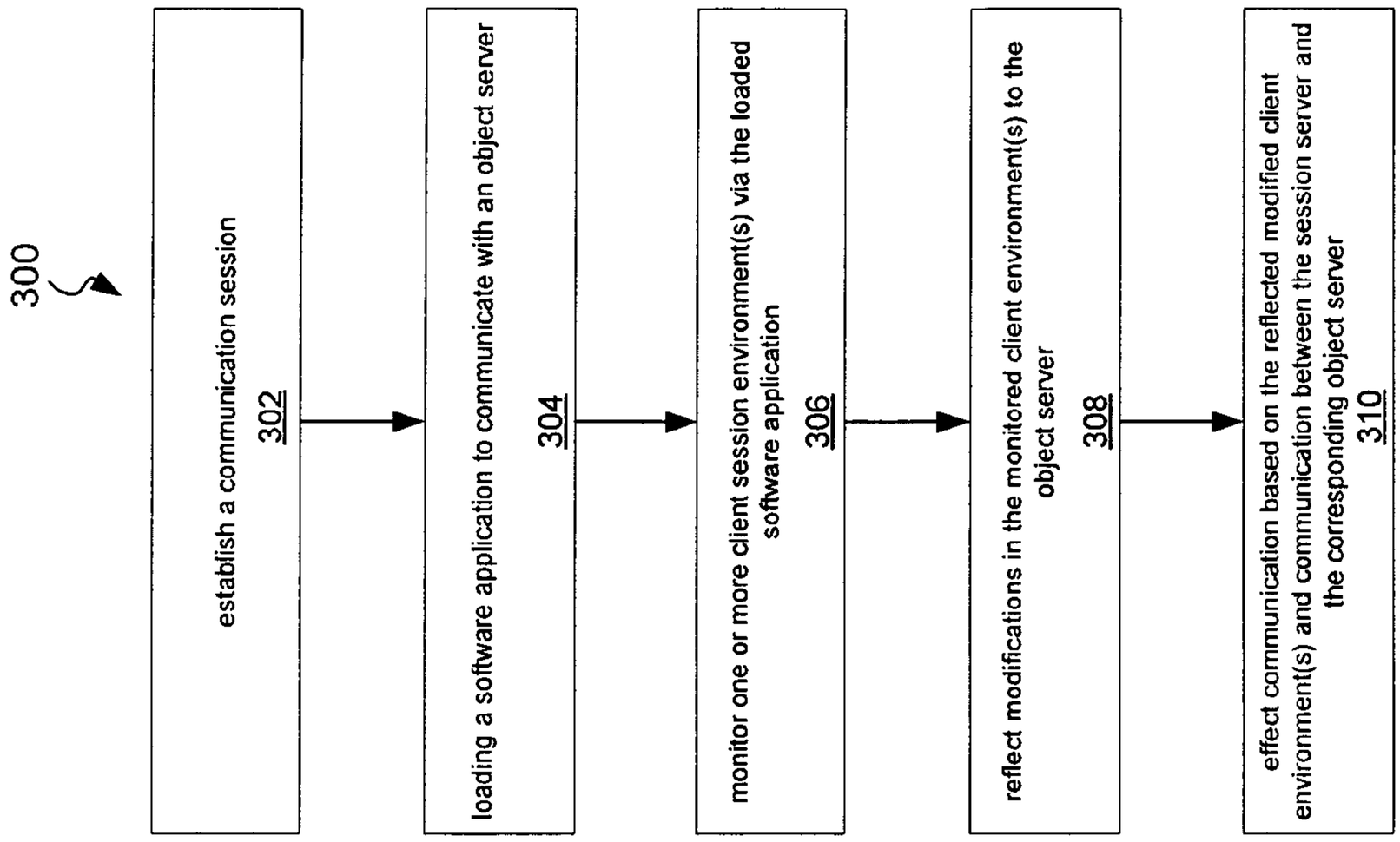

300
establish a communication session
302
loading a software application to communicate with an object server
304
monitor one or more client session environment(s) via the loaded software application
306
reflect modifications in the monitored client environment(s) to the object server
308
effect communication based on the reflected modified client environment(s) and communication between the session server and the corresponding object server
310

FIG. 3

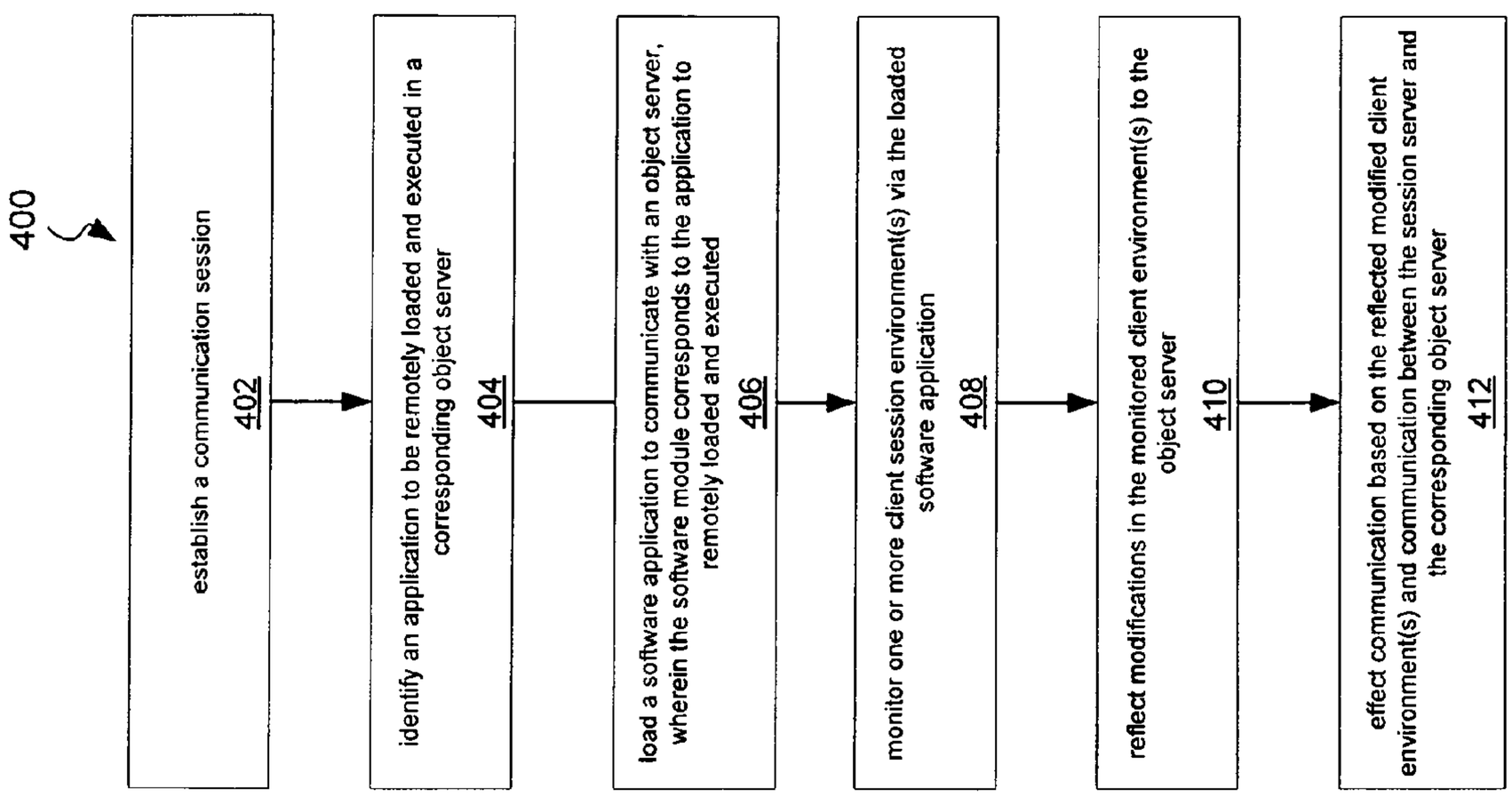

400
establish a communication session
402
identify an application to be remotely loaded and executed in a corresponding object server
404
load a software application to communicate with an object server, wherein the software module corresponds to the application to remotely loaded and executed
406
monitor one or more client session environment(s) via the loaded software application
408
reflect modifications in the monitored client environment(s) to the object server
410
effect communication based on the reflected modified client environment(s) and communication between the session server and the corresponding object server
412

FIG. 4

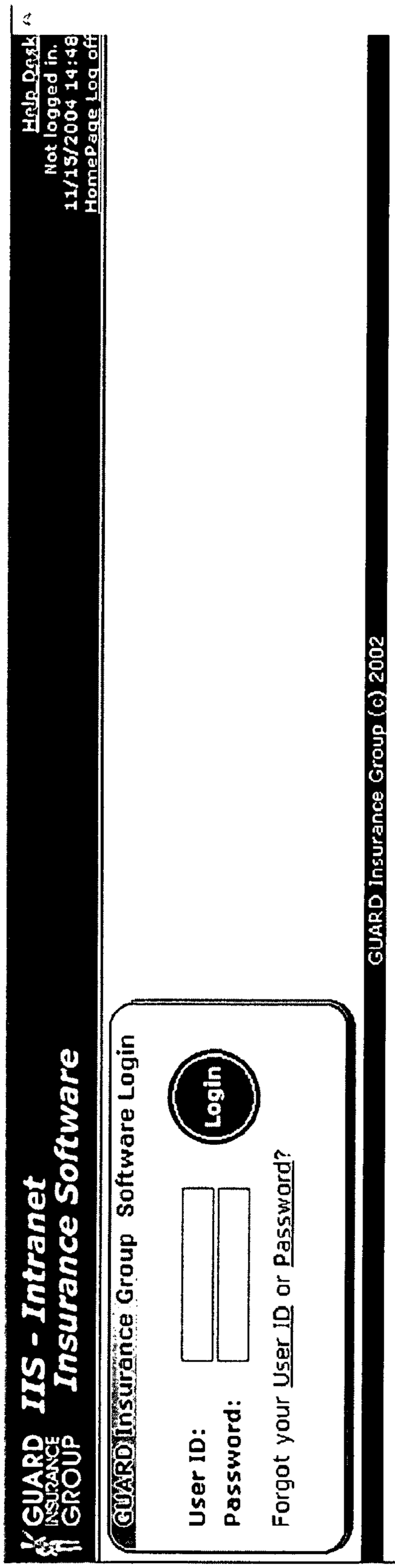

Help Desk
Not logged in.
11/15/2004 14:48
HomePage Log off
IIS - Intranet
Insurance Software
GUARD INSURANCE GROUP
GUARD Insurance Group Software Login
User ID:
Password:
Login
Forgot your User ID or Password?
GUARD Insurance Group (c) 2002

FIG. 5

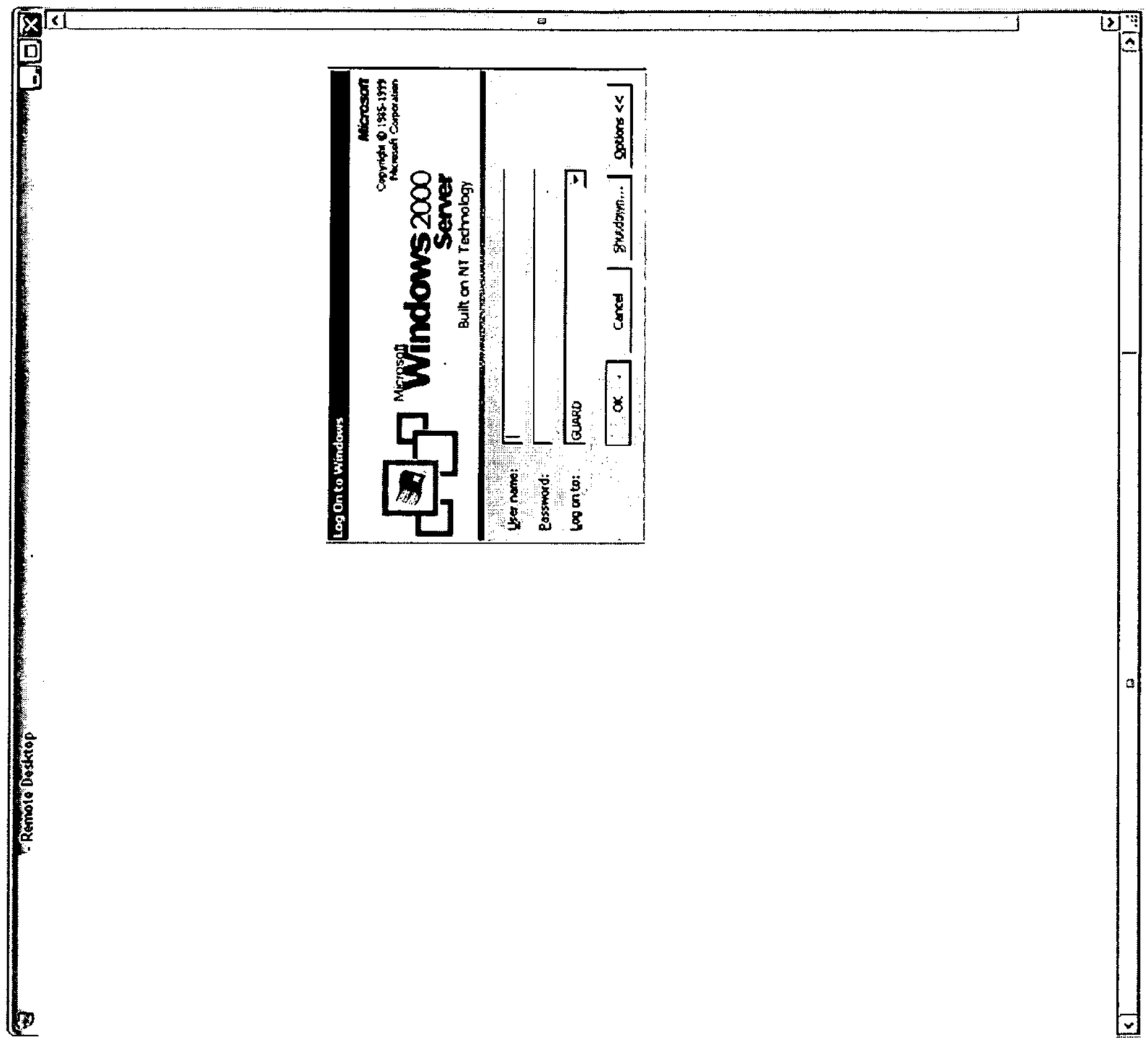
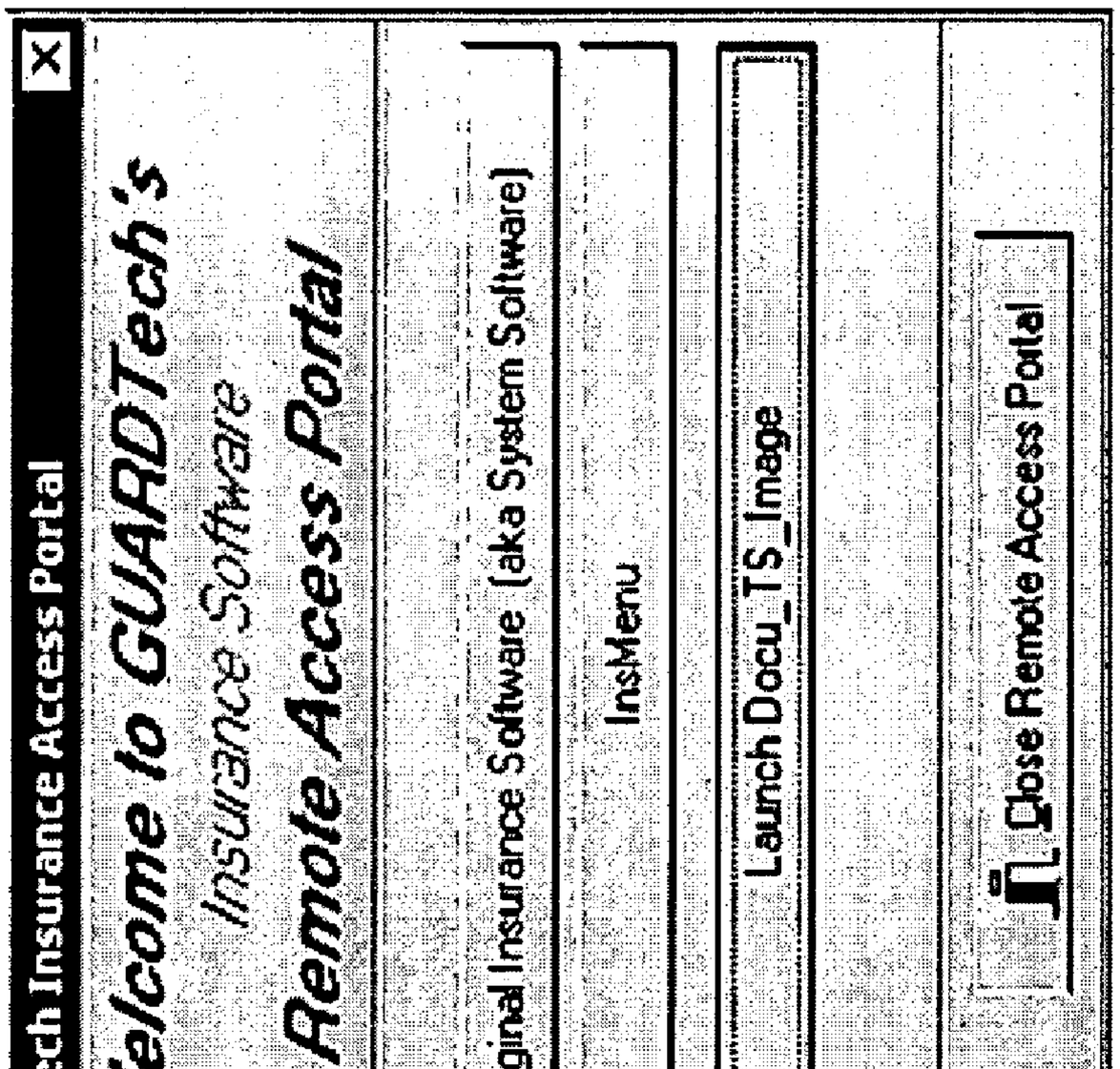

- Remote Desktop
Log On to Windows
Microsoft
Copyright © 1985-1999
Microsoft Corporation
Microsoft Windows 2000 Server
Built on NT Technology
User name:
Password:
Log on to:
GUARD
OK
Cancel
Shutdown...
Options <<

FIG. 6


GUARDTech Insurance Access Portal
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Remote Access Portal
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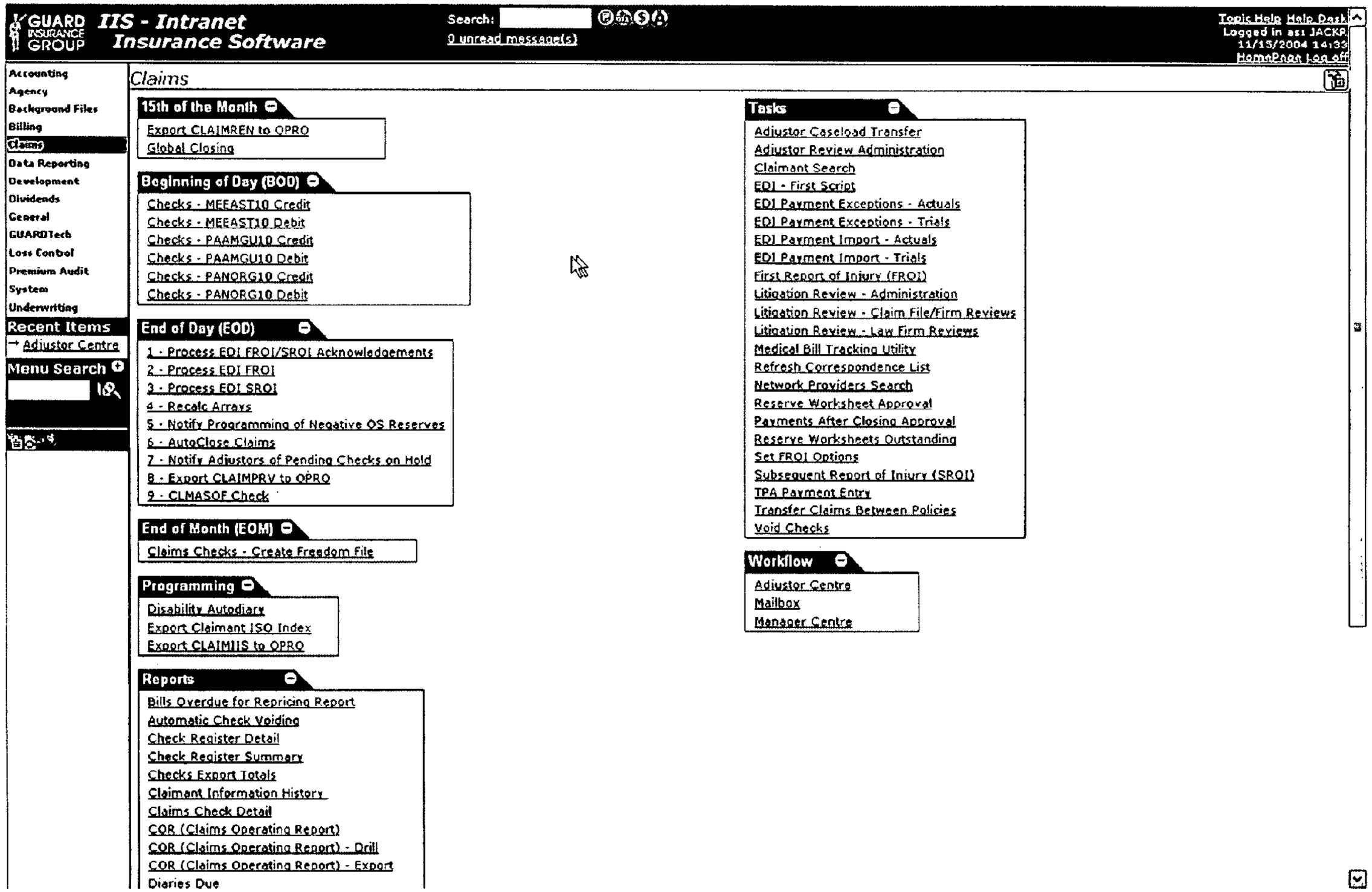
FIG. 7


GUARD INSURANCE GROUP
IIS - Intranet Insurance Software
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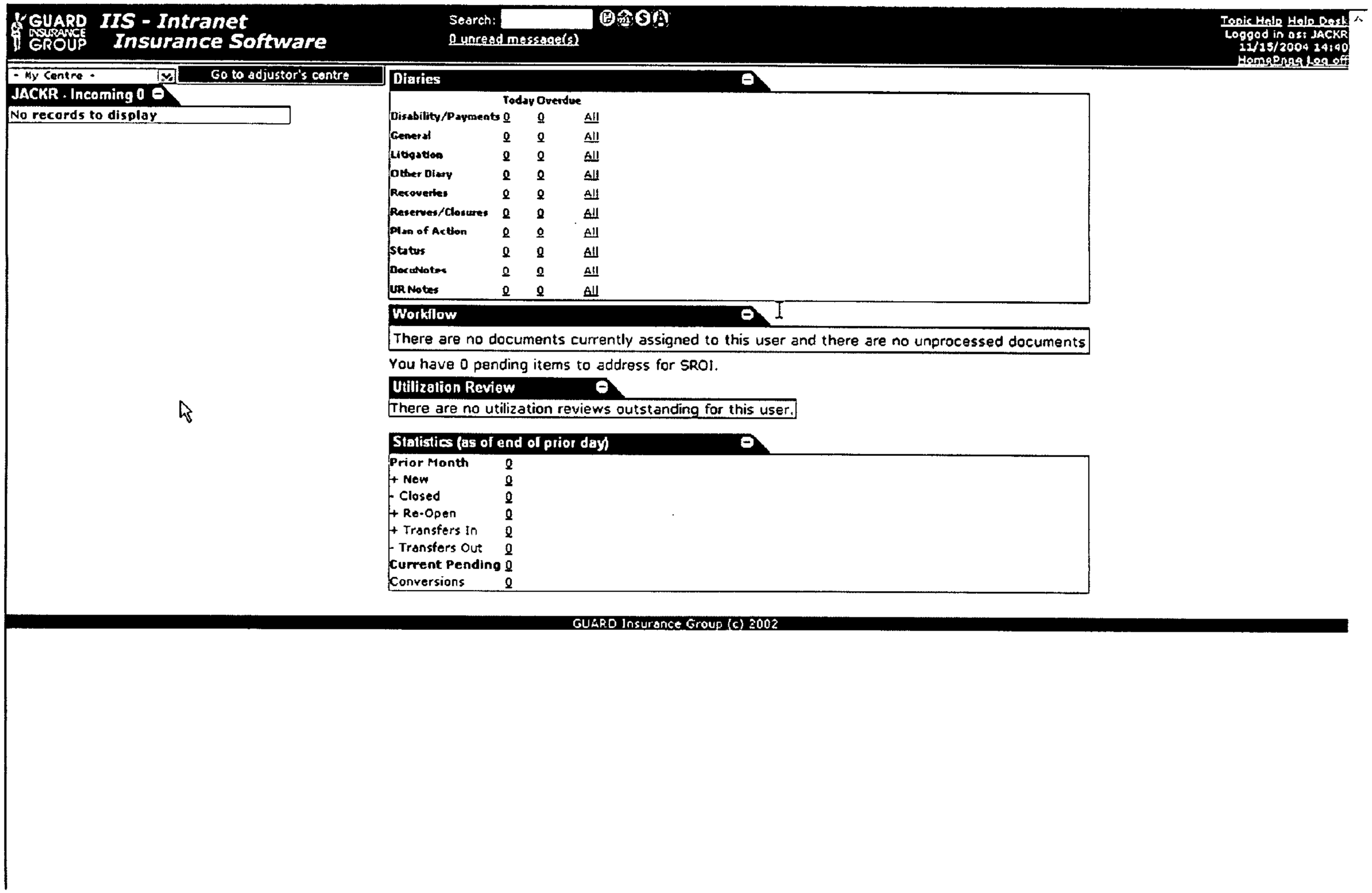
HomePage Log off
Accounting
Agency
Background Files
Billing
Claims
Data Reporting
Development
Dividends
General
GUARDTech
Loss Control
Premium Audit
System
Underwriting
Recent Items
Adjustor Centre
Menu Search
Claims
15th of the Month
Export CLAIMREN to QPRO
Global Closing
Beginning of Day (BOD)
Checks - MEEAST10 Credit
Checks - MEEAST10 Debit
Checks - PAAMGU10 Credit
Checks - PAAMGU10 Debit
Checks - PANORG10 Credit
Checks - PANORG10 Debit
End of Day (EOD)
1 - Process EDI FROI/SROI Acknowledgements
2 - Process EDI FROI
3 - Process EDI SROI
4 - Recalc Arrays
5 - Notify Programming of Negative OS Reserves
6 - AutoClose Claims
7 - Notify Adjustors of Pending Checks on Hold
8 - Export CLAIMPRV to QPRO
9 - CLMASOF Check
End of Month (EOM)
Claims Checks - Create Freedom File
Programming
Disability Autodiary
Export Claimant ISO Index
Export CLAIMJIS to QPRO
Reports
Bills Overdue for Repricing Report
Automatic Check Voiding
Check Register Detail
Check Register Summary
Checks Export Totals
Claimant Information History
Claims Check Detail
COR (Claims Operating Report)
COR (Claims Operating Report) - Drill
COR (Claims Operating Report) - Export
Diaries Due
Tasks
Adjustor Caseload Transfer
Adjustor Review Administration
Claimant Search
EDI - First Script
EDI Payment Exceptions - Actuals
EDI Payment Exceptions - Trials
EDI Payment Import - Actuals
EDI Payment Import - Trials
First Report of Injury (FROI)
Litigation Review - Administration
Litigation Review - Claim File/Firm Reviews
Litigation Review - Law Firm Reviews
Medical Bill Tracking Utility
Refresh Correspondence List
Network Providers Search
Reserve Worksheet Approval
Payments After Closing Approval
Reserve Worksheets Outstanding
Set FROI Options
Subsequent Report of Injury (SROI)
TPA Payment Entry
Transfer Claims Between Policies
Void Checks
Workflow
Adjustor Centre
Mailbox
Manager Centre

FIG. 8


GUARD INSURANCE GROUP
IIS - Intranet Insurance Software
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- My Centre -
Go to adjustor's centre
JACKR - Incoming 0
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Disability/Payments 0 0 All
General 0 0 All
Litigation 0 0 All
Other Diary 0 0 All
Recoveries 0 0 All
Reserves/Closures 0 0 All
Plan of Action 0 0 All
Status 0 0 All
DocuNotes 0 0 All
UR Notes 0 0 All
Workflow
There are no documents currently assigned to this user and there are no unprocessed documents
You have 0 pending items to address for SROI.
Utilization Review
There are no utilization reviews outstanding for this user.
Statistics (as of end of prior day)
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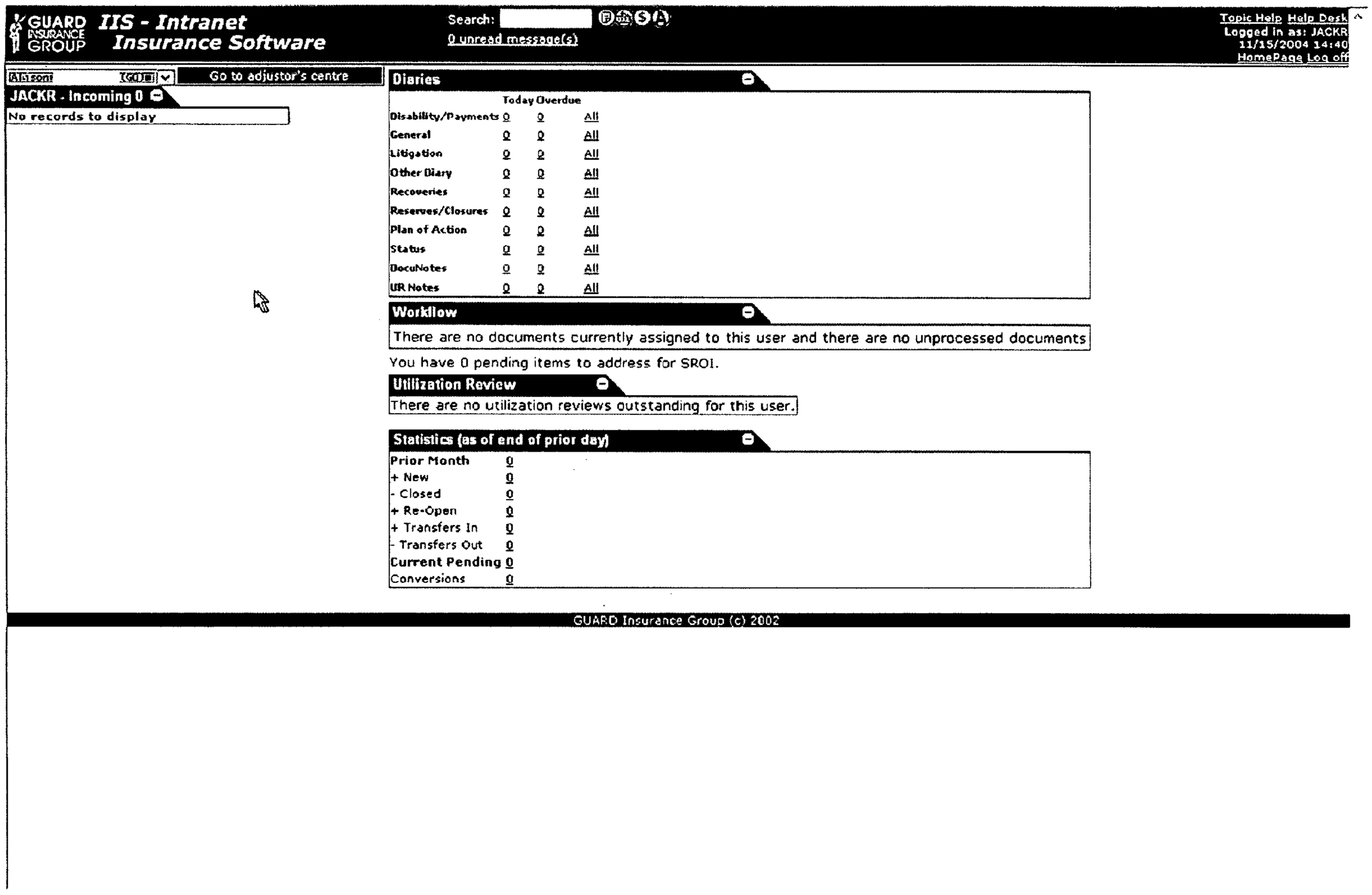
- Closed 0
+ Re-Open 0
+ Transfers In 0
- Transfers Out 0
Current Pending 0
Conversions 0
GUARD Insurance Group (c) 2002

FIG. 9


GUARD INSURANCE GROUP
IIS - Intranet Insurance Software
Search:
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Topic Help Help Desk
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11/15/2004 14:40
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Alt+soni
GO
Go to adjustor's centre
JACKR - Incoming 0
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Diaries
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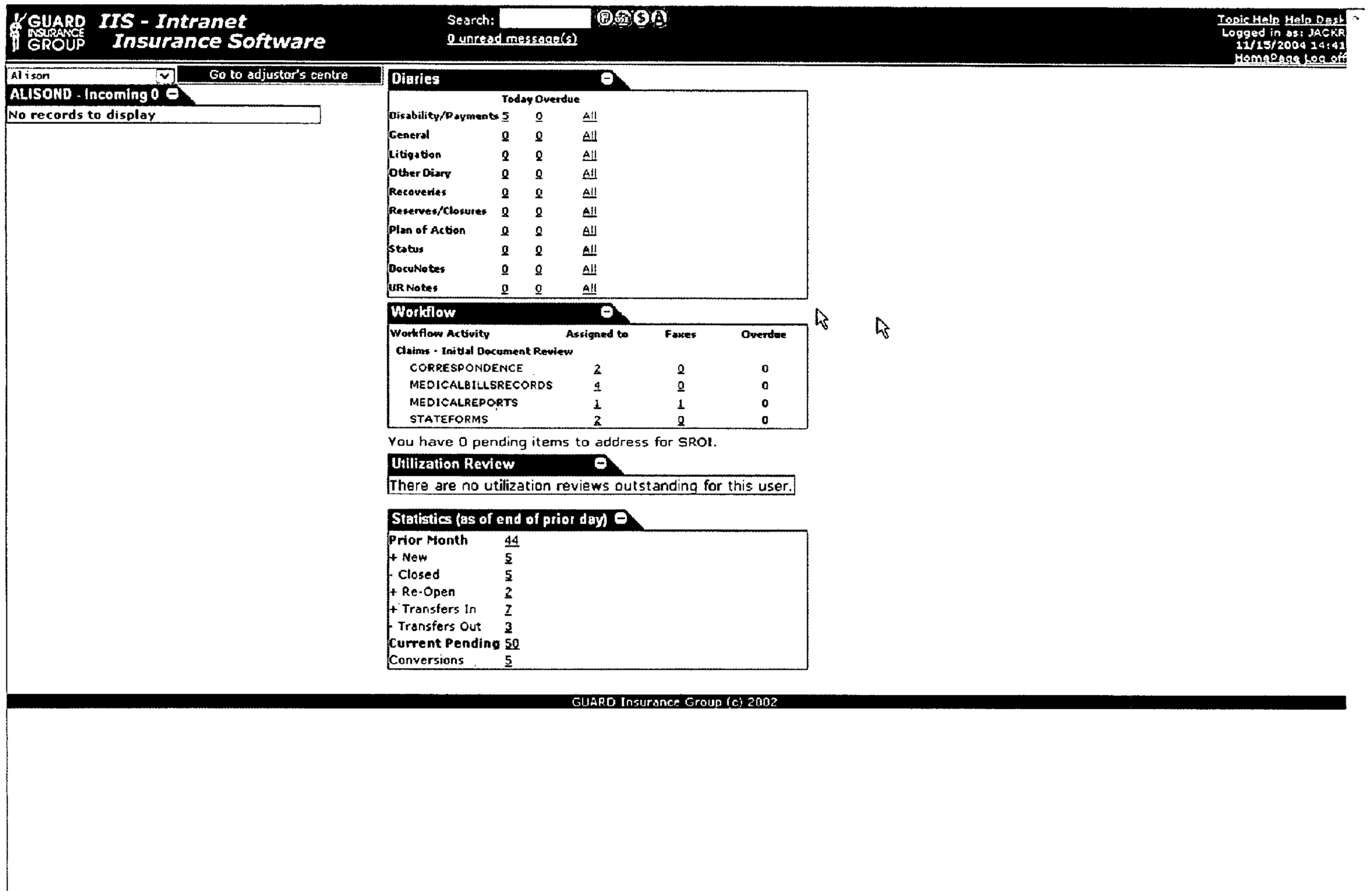
General 0 0 All
Litigation 0 0 All
Other Diary 0 0 All
Recoveries 0 0 All
Reserves/Closures 0 0 All
Plan of Action 0 0 All
Status 0 0 All
DocuNotes 0 0 All
UR Notes 0 0 All
Workflow
There are no documents currently assigned to this user and there are no unprocessed documents
You have 0 pending items to address for SROI.
Utilization Review
There are no utilization reviews outstanding for this user.
Statistics (as of end of prior day)
Prior Month 0
+ New 0
- Closed 0
+ Re-Open 0
+ Transfers In 0
- Transfers Out 0
Current Pending 0
Conversions 0
GUARD Insurance Group (c) 2002

FIG. 10


GUARD INSURANCE GROUP
IIS - Intranet Insurance Software
Search:
0 unread message(s)
Topic Help Help Desk
Logged in as: JACKR
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HomePage Log off
Alison
Go to adjustor's centre
ALISOND - Incoming 0
No records to display
Diaries
Today Overdue
Disability/Payments 5 0 All
General 0 0 All
Litigation 0 0 All
Other Diary 0 0 All
Recoveries 0 0 All
Reserves/Closures 0 0 All
Plan of Action 0 0 All
Status 0 0 All
DocuNotes 0 0 All
UR Notes 0 0 All
Workflow
Workflow Activity Assigned to Faxes Overdue
Claims - Initial Document Review
CORRESPONDENCE 2 0 0
MEDICALBILLSRECORDS 4 0 0
MEDICALREPORTS 1 1 0
STATEFORMS 2 0 0
You have 0 pending items to address for SROI.
Utilization Review
There are no utilization reviews outstanding for this user.
Statistics (as of end of prior day)
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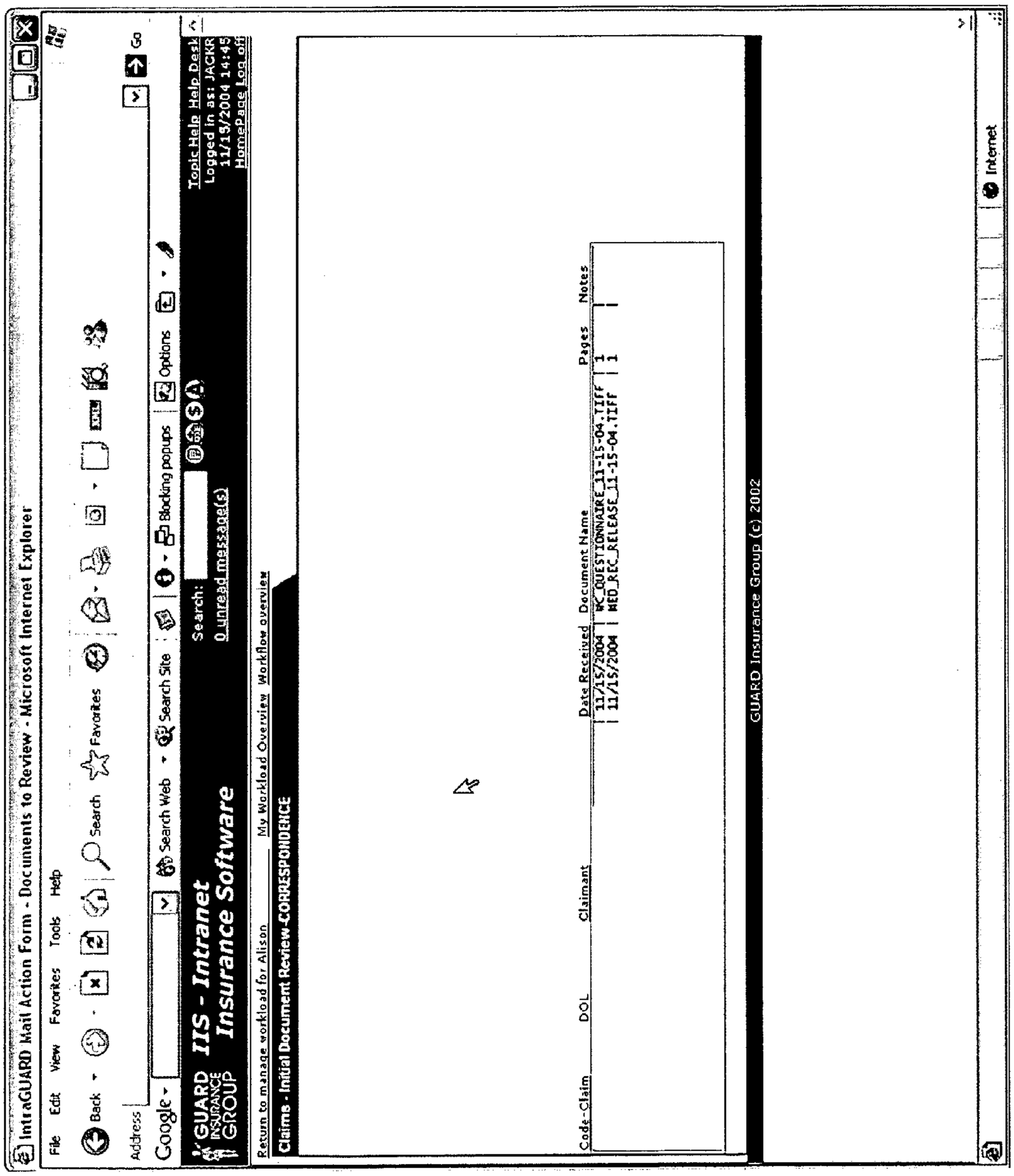
+ New 5
- Closed 5
+ Re-Open 2
+ Transfers In 7
- Transfers Out 3
Current Pending 50
Conversions 5
GUARD Insurance Group (c) 2002

FIG. 11


IntraGUARD Mail Action Form - Documents to Review - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address
Google
Search Web Search Site Blocking popups Options
GUARD INSURANCE GROUP
IIS - Intranet Insurance Software
Search:
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Topic Help
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My Workload Overview Workflow overview
Return to manage workload for Alison
Claims - Initial Document Review-CORRESPONDENCE
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GUARD Insurance Group (c) 2002
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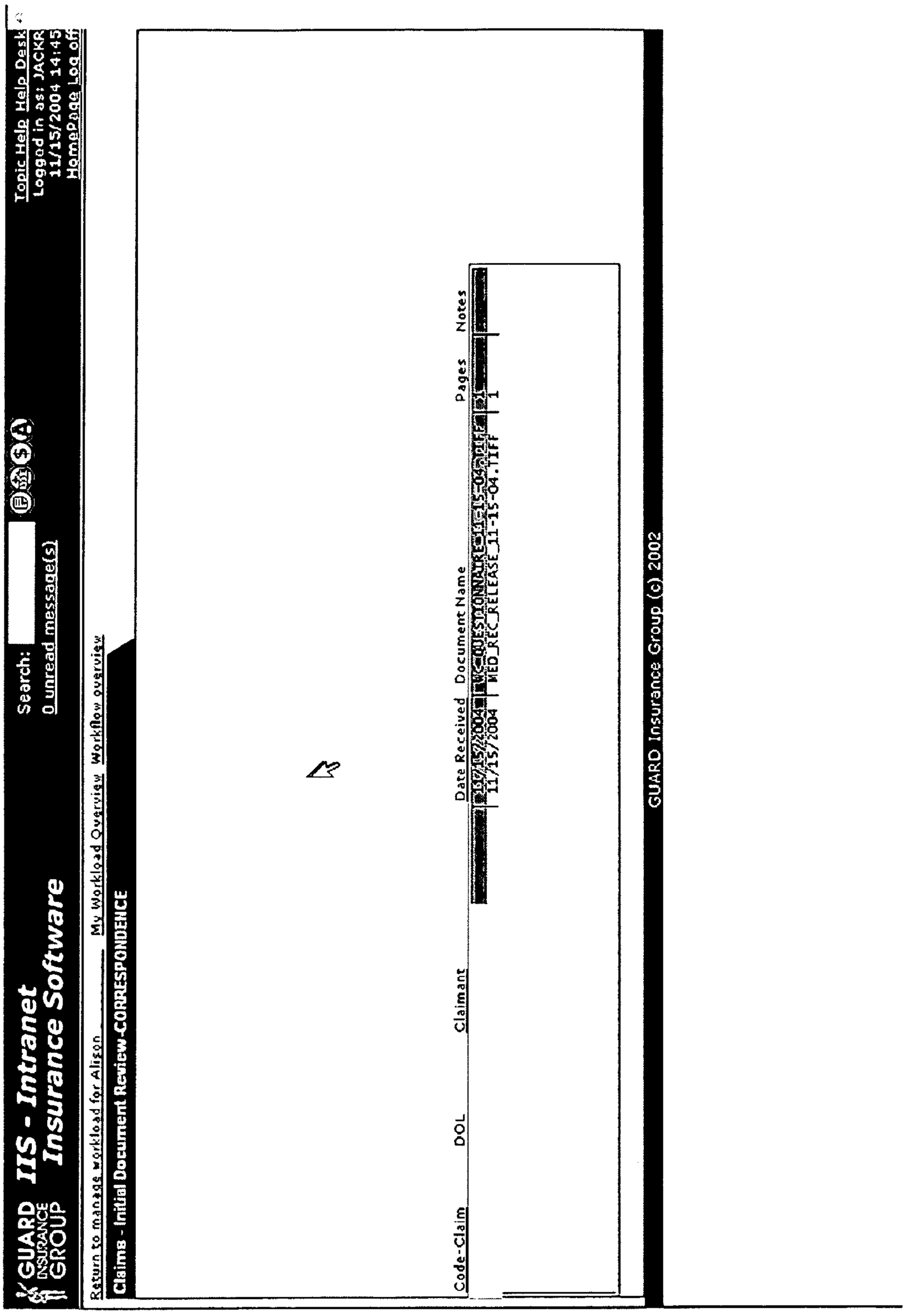
FIG. 12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Insurance Software
GUARD INSURANCE GROUP
My Workload Overview Workflow overview
CORRESPONDENCE
Return to manage workload for Alison
Claims - Initial Document Review-CORRESPONDENCE
Code-Claim
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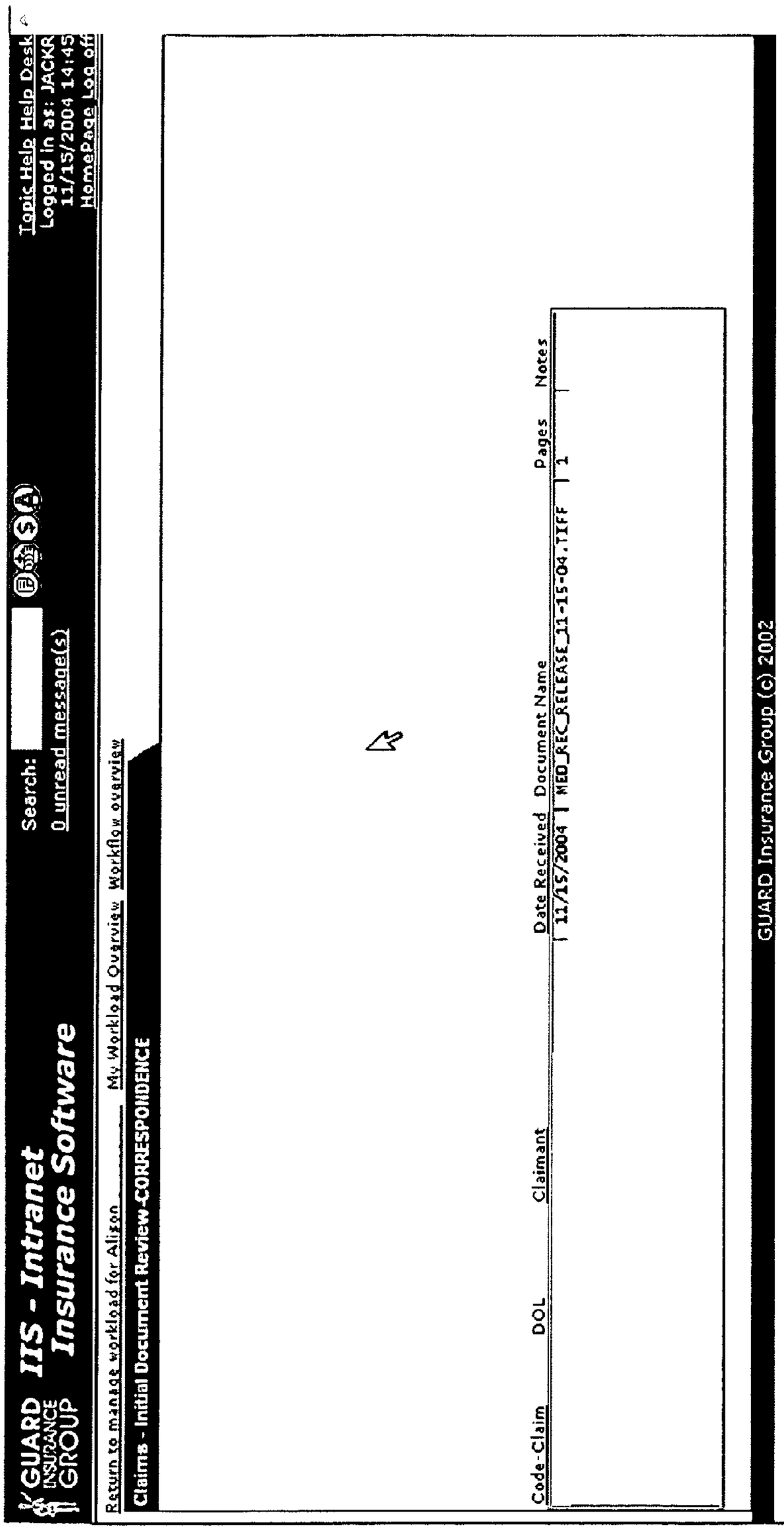
GUARD Insurance Group (c) 2002

FIG. 13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IIS - Intranet
Insurance Software
GUARD INSURANCE GROUP
My Workload Quarview Workflow overview
Return to manage workload for Alison
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GUARD Insurance Group (c) 2002

FIG. 14

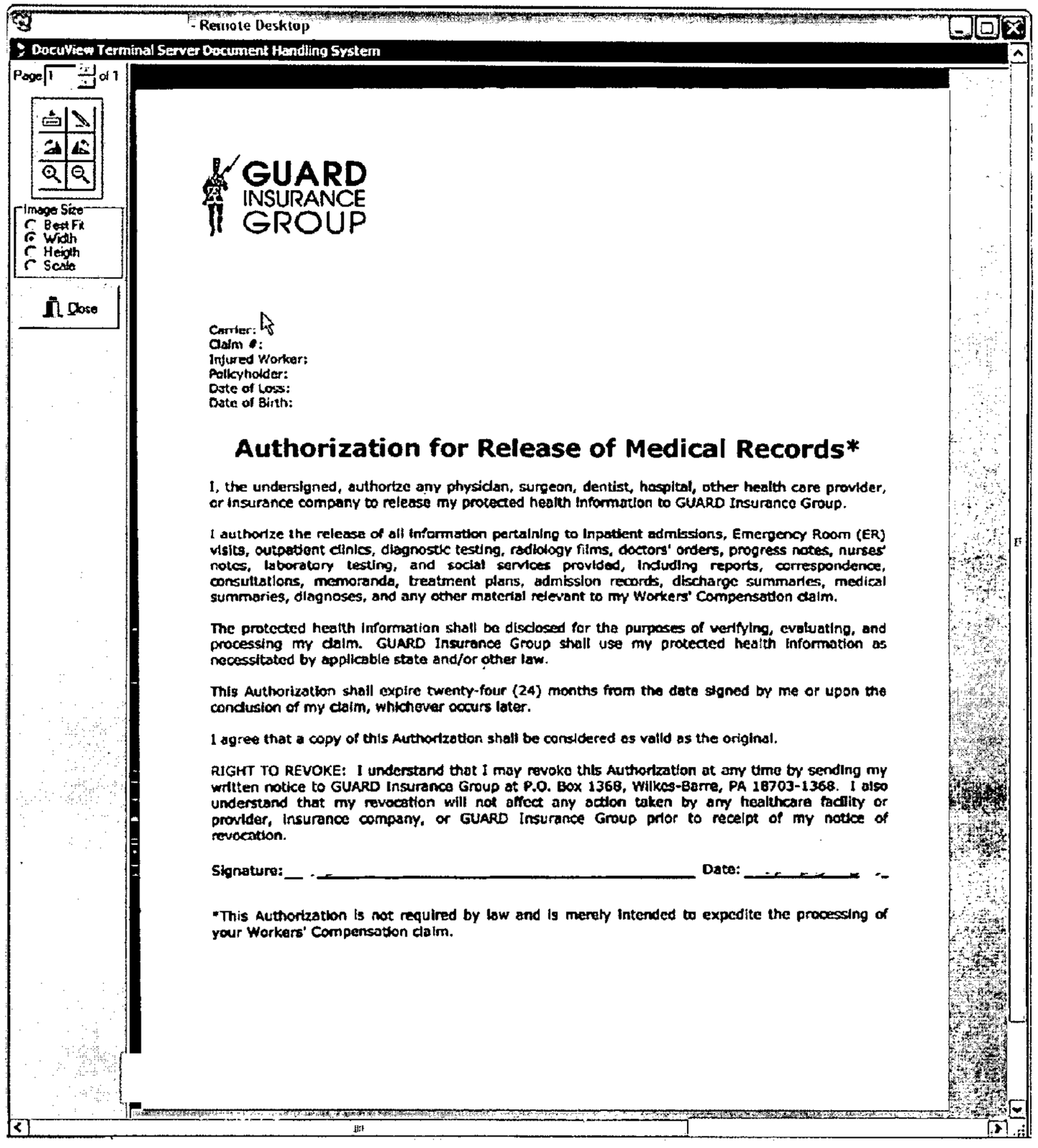
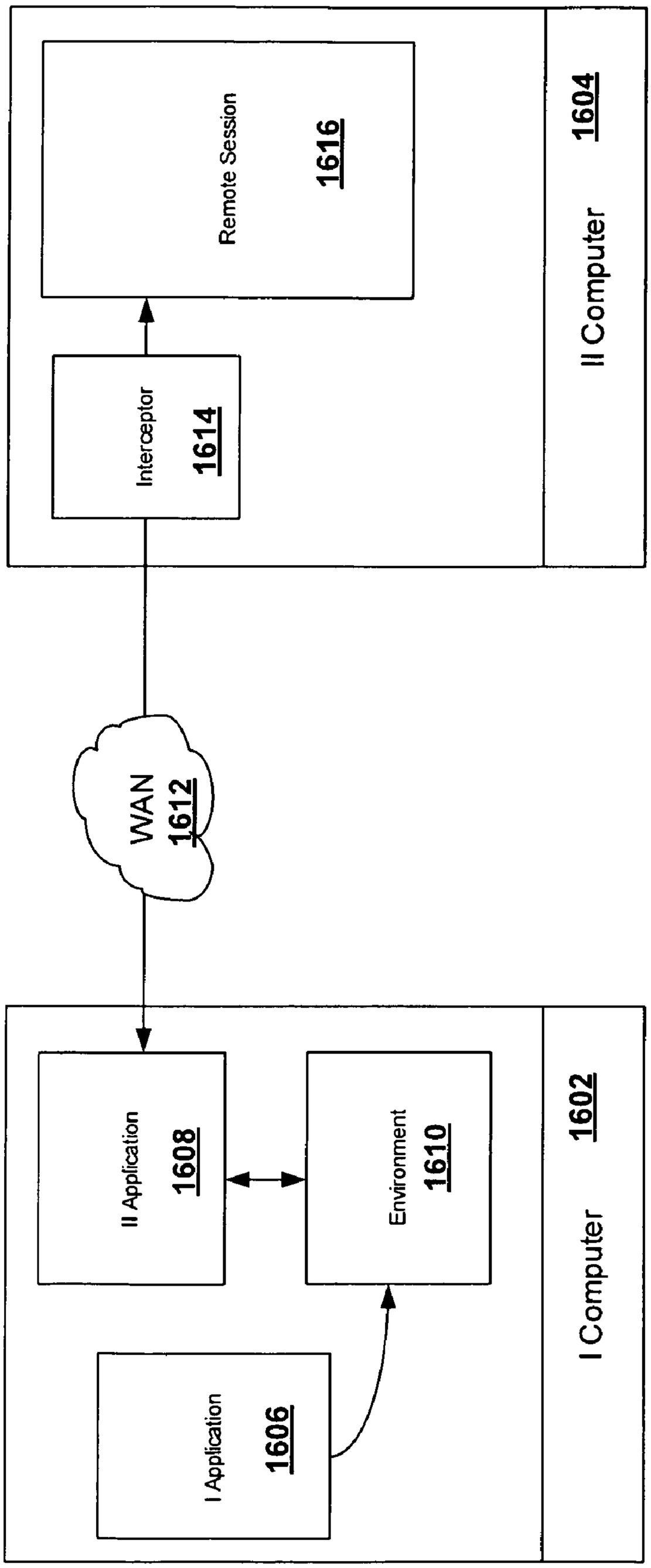

- Remote Desktop
DocuView Terminal Server Document Handling System
Page 1 of 1
Image Size
Best Fit
Width
Height
Scale
Close
GUARD INSURANCE GROUP
Carrier:
Claim #:
Injured Worker:
Policyholder:
Date of Loss:
Date of Birth:
Authorization for Release of Medical Records*
I, the undersigned, authorize any physician, surgeon, dentist, hospital, other health care provider, or insurance company to release my protected health information to GUARD Insurance Group.
I authorize the release of all information pertaining to inpatient admissions, Emergency Room (ER) visits, outpatient clinics, diagnostic testing, radiology films, doctors' orders, progress notes, nurses' notes, laboratory testing, and social services provided, including reports, correspondence, consultations, memoranda, treatment plans, admission records, discharge summaries, medical summaries, diagnoses, and any other material relevant to my Workers' Compensation claim.
The protected health information shall be disclosed for the purposes of verifying, evaluating, and processing my claim. GUARD Insurance Group shall use my protected health information as necessitated by applicable state and/or other law.
This Authorization shall expire twenty-four (24) months from the date signed by me or upon the conclusion of my claim, whichever occurs later.
I agree that a copy of this Authorization shall be considered as valid as the original.
RIGHT TO REVOKE: I understand that I may revoke this Authorization at any time by sending my written notice to GUARD Insurance Group at P.O. Box 1368, Wilkes-Barre, PA 18703-1368. I also understand that my revocation will not affect any action taken by any healthcare facility or provider, insurance company, or GUARD Insurance Group prior to receipt of my notice of revocation.
Signature: Date:
*This Authorization is not required by law and is merely intended to expedite the processing of your Workers' Compensation claim.

FIG. 15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Remote Session 1616
Interceptor 1614
WAN 1612
II Application 1608
Environment 1610
I Application 1606
I Computer 1602

FIG.16

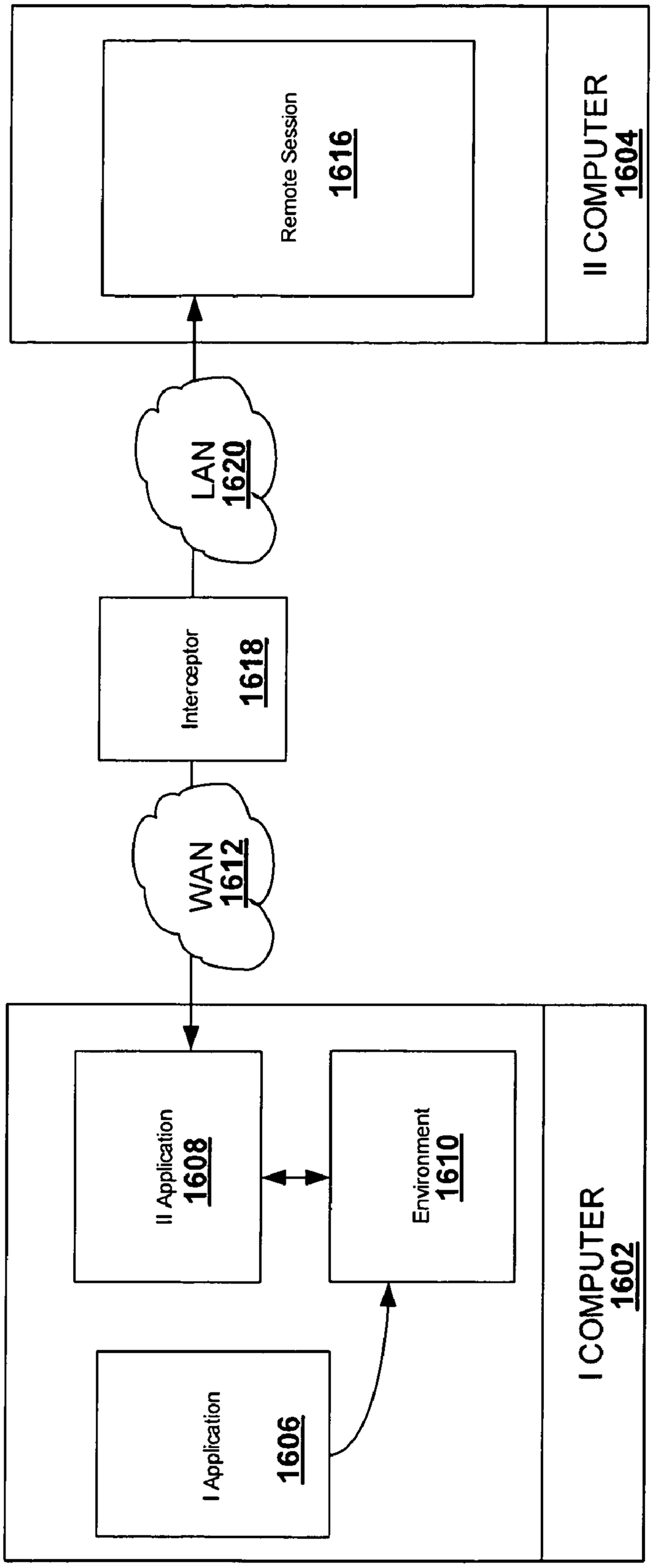
II COMPUTER
1604
Remote Session
1616
LAN
1620
Interœptor
1618
WAN
1612
I COMPUTER
1602
II Application
1608
Environment
1610
I Application
1606

FIG.17

ELECTRONIC DEVICE AND REMOTE COMPUTER SYSTEM AND METHOD FOR CONTROLLING REMOTE COMMUNICATIONS

RELATED APPLICATIONS

This application is a Continuation of U.S. application Ser. No. 12/255,319, filed Oct. 21, 2008, pending, which is a Continuation-In-Part of U.S. application Ser. No. 10/905,102, filed Dec. 15, 2004, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of Invention

The present invention relates generally to the field of remote processing and remote access solutions. More specifically, the present invention is related to a remote communication system and method between an electronic device and a remote computer.

2. Discussion of Prior Art

There are a myriad of prior art remote access solutions available such as Symantec's PCAnywhere™ and GoToMyPC™ wherein users utilize specific remote access software to gain access to remote servers or PC's. FIGS. **1***a-b* illustrate two such prior art remote access schemes. In a first scheme, depicted in FIG. **1***a*, users (such as user **102**) interested in gaining remote access to a remote server **110** first install server-specific remote access software (such as a java script **104** or ActiveX component **106**) on his/her personal computer (PC) **108**. Next, using the installed server-specific remote access software, users access the remotely located server **110** over network **112** (e.g., local area network (LAN), wide area network (WAN), the Internet, etc.).

In a second scenario, depicted in FIG. **1***b*, users (such as user **114**) who wish to remotely access their PC **116** install specific remote access software (such as java script **118** or ActiveX component **120**) on the PC **116** that is to be remotely accessed. Next, user **114**, or someone who is authorized to access PC **116** (such as a system administrator), is able to remotely access PC **116** over network **128** (e.g., local area network (LAN), wide area network (WAN), the Internet, etc.) after installing specific remote access software (such as a java script **122** or ActiveX component **124**) via PC **126**.

For example, users who are interested in remotely accessing their office PC **116** from a remote location install software such as Symantec's PCAnywhere™ software on their office PC **116**. Next, users have to install a corresponding version of Symantec's PCAnywhere software in computer **126** from a remote location prior to being able to access the remotely located office PC (which should also be running the remote access software at the time access is requested).

A common aspect of prior art remote access solutions, such as the one depicted in FIGS. **1***a* and **1***b*, is the necessity to install specific remote access software in a client PC prior to establishing communication with a remote server or remote PC, which also requires the pre-installation of remote access software.

The following patents provide general background regarding client/server interactions, but fail to overcome many of the limitations provided by the present invention.

The patent to Cavil (U.S. Pat. No. 6,003,069) provides for a client/server printer driver system. Cavil discloses a client terminal capable of submitting a job to a server, which processes the request and sends processed data to the client terminal. Additionally disclosed is a subsystem allowing a client terminal to send a portion of data to one or more servers

and/or process a portion of data on the disclosed client itself. The disclosed subsystem is comprised of facilities to combine processed data from each of the different destinations to which the disclosed client terminal sent process requests.

The patent to Hare et al. (U.S. Pat. No. 6,625,641) provides for a method and apparatus for providing client support without installation of server software. Hare et al. disclose a client process executing on a local machine, having access to server software physically stored on a remote machine. When a client process has a request, a remote server software entry is located in a mount table entry. Once contact is made between a client and remote host, object services are provided to the disclosed client process. Also disclosed is a method of allowing a client process to locate an active server process at a remote host machine by utilizing the disclosed mount table entry. Processes are located and contacted on a remote host without user intervention.

The patent application publication to Mizutani (2003/0105813 A1) discloses a system and method for allowing client application processing requests to be processed on a server. A client-side I/O device is initialized based on information received from a server. The disclosed I/O device receives output information provided by the application-processing unit of the disclosed server in response to processing input information received from a client.

The Japanese patent to Asada (JP 9-204383) discloses a method of selecting and connecting to a server terminal with a light load. As a result of the disclosed selection process, applications executed on the server execute faster.

The Japanese patent to Wada et al. (JP 2003-30383) discloses a method connecting a client terminal to a data center storing requested rental software. The disclosed data center is also comprised of a form generation database allowing for client input. See abstract.

Whatever the precise merits, features, and advantages of the above cited references, none of them achieves or fulfills the purposes of the present invention.

SUMMARY OF THE INVENTION

The present invention provides for a method as implemented in a first application running in an electronic device comprising: (a) identifying an environment associated with the electronic device, the electronic device remotely controlling, via a second application, a remote session on a remote computer over a first network, the remote controlling performed via a bidirectional communication, and the environment defining a plurality of parameters communicated between the electronic device and the remote computer as part of the remote session, each parameter in the plurality of parameters defining an action associated with the remote session; and (b) the first application running in the electronic device, via a unidirectional communication with the environment, modifying at least one parameter associated with the environment, the modified parameter extracted by an interceptor associated with the second computer and, based on a look-up, executing a pre-defined action affecting the remote session, the pre-defined action different than said modified parameter's associated action.

The present invention also provides for a method as implemented in a first application associated with a computer-based device comprising: (a) identifying an environment associated with the computer-based device, the computer-based device remotely controlling, via a second application, a remote session on a remote computer over a first network, the remote controlling performed via a bidirectional communication, and the environment defining a plurality of parameters

communicated between the computer-based device and the remote computer as part of the remote session, each parameter in the plurality of parameters defining an action associated with the remote session; and (b) the first application running in the computer-based device, via a unidirectional communication with the environment, modifying at least one parameter associated with the environment, the modified parameter extracted by an interceptor associated with the remote computer and, based on a look-up, executing a pre-defined action affecting the remote session, the pre-defined action different than the modified parameter's associated action.

The preset invention also provides for a method as implemented in a first application running in an electronic device comprising: (a) identifying an environment associated with the electronic device, the electronic device remotely controlling, via a second application, a remote session on a remote computer over a first network, the remote controlling performed via a bidirectional communication, and the environment defining a plurality of parameters communicated between the electronic device and the remote computer as part of the remote session, each parameter in the plurality of parameters defining an action associated with the remote session; (b) identifying at least one parameter to be modified and temporarily storing contents associated with the identified parameter in computer storage; (c) the first application running in the electronic device, via a unidirectional communication with the environment, modifying the identified parameter, the modified parameter extracted by an interceptor associated with the second computer and, based on a look-up, executing a pre-defined action affecting the remote session, the pre-defined action different than the modified parameter's associated action; and (c) restoring contents associated with the identified parameter from the computer storage.

The present invention also provides for an article of manufacture having computer readable program code implementing each of the above-described methods.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. **1***a* and **1***b* illustrate two prior art remote access schemes.

FIG. **2** illustrates an exemplary embodiment of the communication system of the present invention.

FIG. **3** illustrates an exemplary method of the present invention

FIG. **4** illustrates another embodiment of the present invention's communication method implemented in a session server for remote access to applications implemented in object servers, wherein each object server implements at least one application

FIGS. **5** through **15** illustrate various screenshots of one implementation of the present invention's system and method for remote access to applications implemented in object servers.

FIG. **16** illustrates one embodiment of the present invention's interceptor.

FIG. **17** illustrates another embodiment of the present invention's interceptor.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

While this invention is illustrated and described in a preferred embodiment, the invention may be produced in many different configurations. There is depicted in the drawings, and will herein be described in detail, a preferred embodiment of the invention, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and the associated functional specifications for its construction and is not intended to limit the invention to the embodiment illustrated. Those skilled in the art will envision many other possible variations within the scope of the present invention.

The present invention provides for a method and system for remote communication. FIG. **2** illustrates an exemplary embodiment of the communication system of the present invention. The present invention's communication system provides access to remotely controllable applications, wherein the system comprises a session server **202** and one or more object servers **204**, **206**, **208**, and **210**. Each object server is associated with at least one remotely controllable application, wherein processing associated with the remotely controllable application affected by reflected modifications in one or more client environment(s) (such as client environment(s) associated with client **200**). Session server **202** stores one or more software modules, wherein each software module is capable of monitoring modifications to at least one client environment (such as client environment(s) associated with client **200**) and communicating with at least one object server (**204**, **206**, **208**, or **210**) to reflect such modifications. Session server **202** establishes a communication session with one or more clients (such as client **200**), identifies at least one remotely controllable application associated with the communication session, loads a software module corresponding to identified remotely controllable application to communicate with corresponding object server (**204**, **206**, **208**, or **210**), monitors modifications to client environment via the loaded software module, and reflects modifications in said client environment to said corresponding object server.

It should be noted that session server **202** and object server **204**, **206**, **208**, or **210** does not have to be in the same premises, nor, the same segment of a network. They can be on a separate LAN, VAN, or WAN. Hence, the specific locations of the session server and the object servers should not be used to restrict the scope of the present invention.

FIG. **3** illustrates exemplary method **300** of the present invention. In step **302**, a communication session is established between a session server and a client. As one example, the communication session is established as a virtual private network (VPN) session. In the preferred embodiment, the client is a web browser (e.g., Internet Explorer™, Netscape™, Mozilla™, etc.) and the session server is a terminal server. Also, in one embodiment, communication between the client and the session server is performed via the remote desktop Protocol™ (RDP). It should be noted that communication between the client and the session server is over any of, or a combination of, the following networks: a local area network (LAN), a wide area network (WAN), or the Internet.

In step **304**, the session server loads at least one software application among a plurality of software applications to communicate with at least one object server. Next, in step **306**, the loaded software application monitors one or more client environment(s) to detect any changes in the client environment(s). In step **308**, the loaded software application reflects modified client environment(s) to the corresponding object server, wherein processing associated with the communication session is effected, in step **310**, based on the reflected modified client environment(s) and communication between the session server and corresponding object server.

In the preferred embodiment, the client environment(s) is reflected using one or more semaphore flags. In one embodiment, a plurality of semaphore flags is used, wherein each flag

is represented via a 16-bit masked constant that triggers a corresponding action. For example, a semaphore flag could be represented by the 16-bit value—00000000:00000001, which corresponds to the action command—OPEN. Similarly, another semaphore flag could be represented by the 16-bit value—00000000:00000010, which corresponds to the action command—CLOSE.

FIG. **4** illustrates another embodiment of the present invention's communication method **400** implemented in a session server for remote access to applications implemented in object servers, wherein each object server implements at least one application. In step **402**, the session server establishes a communication session (e.g., a VPN session) with a client (e.g., a web browser such as Internet Explorer™, Netscape™, Mozilla™, etc.). In step **404**, the session server identifies at least one application to be remotely loaded and executed in a corresponding object server and, in step **406**, the session server loads an appropriate software module to communicate with corresponding object server, wherein the software module corresponds to at least one application to be remotely loaded and executed.

Next, in step **408**, the session server monitors modifications to at least one client environment via the loaded software module and, in step **410**, the session server reflects modifications in the client environment(s) to the corresponding object server. In step **412**, processing associated with the communication session is effected based on reflected modifications in the client environment and communication between the session server and the corresponding object server.

In the preferred embodiment, the client environment(s) is reflected using one or more semaphore flags.

FIGS. **5-15** illustrate various screenshots of one implementation of the present invention's system and method for remote access to applications implemented in object servers. First, an authorized user establishes a virtual private network (VPN) session with a session server. Next, as shown in FIG. **5**, an initial login screen is presented to the user via a client (such as a browser). An authorized user then logs into his/her account using the login page. Similarly, an authorized user opens a remote desktop connection via logging into the session server via a login screen shown in FIG. **6**. After, logging into the session server, an access portal application is rendered to the user as shown in FIG. **7**. The user then clicks on a choice (for example, a user can click on the choice—"Launch Docu_TS_Image") to launch the appropriate application in the session server.

FIG. **8** illustrates a sample screenshot after an authorized user logs into his/her account via the login of FIG. **5**. In this example, the user clicks on "Adjustor Centre" (of FIG. **8**) to view a particular workflow as shown in FIG. **9**. FIG. **10** illustrates the ability to pick and view another user's "Adjustor Centre". FIG. **11** shows a sample "Adjustor Centre", wherein a user can click on various workflow items (such as entries for "Correspondence", "MedicalBillsRecords", MedicalReports", or "StateForms"). Clicking on each of these workflow entries launches appropriate software in the session server to communicate with appropriate object server implementing the workflow entry clicked. For example, when the user clicks on the entry corresponding to item—"Correspondence" and item—"assigned to", the application shows specific correspondence items (such as the two items shown in FIG. **12-14**). When the user further selects and clicks on a specific item of "Correspondence" as in FIG. **14**, the client environment is changed and the change is reflected by the session server to the appropriate object server (e.g., the object server implementing the DocuView application), which responds by rendering data to the client (e.g., browser), as shown in FIG. **15**.

FIG. **16** illustrates an embodiment of the present invention's method as implemented in a first application associated with a first computer **1602** comprising: (a) identifying an environment **1610** associated with the first computer **1602** that is remotely controlling, via a second application **1608**, a remote session **1616** on a second computer over a first network **1612** (the environment **1610** defining a plurality of parameters communicated between computers **1602** and **1604** as part of a remote session **1616**, with each parameter in the plurality of parameters defining an action associated with the remote session **1616**), wherein the remote controlling is performed via a bidirectional communication; and (b) the first application **1606**, via a unidirectional communication with the environment **1610**, modifying at least one parameter associated with the environment **1610**, wherein the modified parameter is extracted by an interceptor **1614** associated with the second computer and, based on a look-up, executes a pre-defined action affecting the remote session **1616**, with the pre-defined action being different than the modified parameter's associated action.

As a non-limiting example, the first computer **1602** is a client and the second computer **1604** is a terminal server, wherein the client is remotely controlling a RDP® session running on the terminal server. The environment **1610** associated with the client is defined by a plurality of parameters associated with the RDP® session, wherein the parameters can be any (but should not be limited to) the following: keyboard scan codes, cursor position, mouse position, clipboard data, screen resolution, or channel administration. Each of these parameters associated with the RDP session have an associated action.

For example, in a RDP session, when the cursor position parameters (x, y) change based on a change in the position of an input device (e.g., a mouse) associated with the client, such position changes in the client-side has an associated action of changing the mouse position in the remote session **1615** running on the terminal server. As another example, in a RDP session, when a key is depressed in an input device (e.g., a keyboard) associated with the client, such a depression of a key at a client has an associated action of inputting the value of the depressed key in the remote session **1615** running on the terminal server. As yet another example, when the second application sets the resolution of the remote session to 1024×768, the value of '1024×768' is set in the client environment which causes the remote session running at the terminal server to be rendered at the resolution of 1024×768.

In this non-limiting example, the first application unidirectionally modifies one of the parameters associated with the environment **1610** (it is important to note that the change is propagated in a unidirectional manner as the first application **1606** does not wait for a feedback or acknowledgement). For example, the first application **1606** changes the value of the cursor position to (−4, 20) in environment **1610**. Interceptor **1614** is aware of the change in the cursor position. Interceptor **1614** has access to a stored table that can be looked up for determining what pre-defined action needs to be executed that corresponds to the cursor position value of (−4, 20). The stored table has a listing of parameter values and associated actions that need to be executed. A simple non-limiting example of the stored table is provided below:

Parameter	Current Value	Associated Action	Modified Value	Pre-Defined Action
Cursor Position	(5, 20)	Place cursor position at x = 5, y = 20	(−4, 20)	Open desktop editor in remote session
Cursor Position	(5, 20)	Place cursor position at x = 5, y = 20	(−5, 20)	Open email application in remote session
Screen Resolution	1024 × 768	Set current remote session resolution to 1024 × 768	1024 × 766	Print currently open file in remote session
Clipboard Data	Value of clipboard	Post value in clipboard into application requesting a paste operation.	Clipboard modified with pasted value changed of "POST(X)"	Enter value of X in current field of application in remote session and run a script.

Although the above-mentioned example illustrates changing the value of the cursor position to an illegal value of −4, it should be noted that the value does not have to be changed to an illegal value as the table can be updated to execute a pre-defined action for a legal value.

Another non-limiting example involved the modification of the clipboard data. The first application unidirectionally modifies the clipboard data (it is important to note that the change is propagated in a unidirectional manner as the first application **1606** does not wait for a feedback or acknowledgement) such that the clipboard has a value of "POST(X)". This value is reflected at the remote session and the Interceptor **1614** has access to a stored table that can be looked up for determining what pre-defined action needs to be executed that corresponds to the clipboard value of "POST(X)". The pre-defined action, which is different than just a paste operation of the value, could be the input of the value of X into a script that is executed. It should be noted that if there is already a string or value in the clipboard (for example, a value that was copied by the user of first computer **1602**), the present invention can temporarily store the clipboard value, modify the clipboard with the new value, execute the pre-defined action corresponding to the modified value, and then revert the clipboard back to the original state of having the temporarily stored value.

The unidirectional nature of parameter modification, where no feedback or acknowledgement is received by the first application **1606** provides for a robust operation as the first application **1606** need not be programmed to account for any network and/or firewall paths that might have to be accounted for during the proper return of an acknowledgement message.

Network **1612** can be any of, or a combination of, the following: local area network (LAN), wide area network (WAN), a wireless local area network (WLAN), wireless wide area network (WWAN), a cellular network, or the Internet.

The present invention, in another embodiment, provides for a method, as implemented in an interceptor associated with a second computer **1604**, comprising: (a) monitoring an environment **1610** associated with a first computer **1602** (the environment defining a plurality of parameters communicated between the first and second computers as part of a remote session, with each parameter defining an action associated with the remote session), wherein the first computer **1602**, via a bi-directional communication, remotely controls a remote session on the second computer **1604** via a second application **1608**, the remote controlling performed over a first network **1612**, and the environment **1610** being bi-directionally accessible by the second application **1608** and unidirectionally accessible by a first application **1606** associated with the first computer **1602**; and (b) intercepting incoming traffic associated with said environment **1610** from the first computer **1602**, and upon detecting a parameter modified by the first application **1606**, extracting the modified parameter, wherein the pre-defined action is different than the modified parameter's associated action; (c) looking-up (e.g., based on a looking up a table) at least one pre-defined action associated with the modified parameter; and (d) executing the at least one pre-defined action, wherein the execution affects the remote session.

The present invention, in yet another embodiment, provides for a method as implemented in a first application associated **1606** with a first computer **1602** comprising: identifying an environment **1610** associated with said first computer **1602** (wherein the environment **1610** defines a plurality of parameters communicated between computers **1602** and **1604** as part of a remote session, with each parameter having a value picked from at least one valid range of values), wherein the first computer **1602** remotely controlling, via a second application **1608**, a remote session on a second computer **1604** over a first network, with the remote controlling being performed via a bidirectional communication, and (b) the first application **1606**, via a unidirectional communication with the environment **1610**, modifying at least one parameter associated with the environment **1610**, the modification comprising changing the value of at least one parameter to be outside its range of valid values, wherein the modified parameter is extracted by an interceptor **1614** associated with the second computer **1604**, which, based on a look-up, executes a pre-defined action affecting the remote session.

Although the interceptor has been described in the above-mentioned description as being associated with the second computer **1604**, it should be noted that the specific location and implementation of the interceptor **1614** is a matter of choice. For example, FIG. **17** illustrates that the interceptor **1614** can be implemented independent of the second computer **1604**. In one embodiment, the interceptor **1618** is independently located behind a local area network (LAN) **1620**. In another embodiment, interceptor **1618** is implemented as part of a router or switch (not shown).

Additionally, the present invention provides for an article of manufacture comprising computer readable program code contained within implementing one or more modules to affect a novel communication method. Furthermore, the present invention includes a computer program code-based product, which is a storage medium having program code stored therein which can be used to instruct a computer to perform any of the methods associated with the present invention. The computer storage medium includes any of, but is not limited to, the following: CD-ROM, DVD, magnetic tape, optical disc, hard drive, floppy disk, ferroelectric memory, flash memory, ferromagnetic memory, optical storage, charge coupled devices, magnetic or optical cards, smart cards,

EEPROM, EPROM, RAM, ROM, DRAM, SRAM, SDRAM, or any other appropriate static or dynamic memory or data storage devices.

Implemented in computer program code based products are: (a) a first application module to be deployed on a first computer, wherein the first computer remotely and bidirectionally communicates and controls a remote session implemented on a second computer, wherein the first application unidirectionally modifies at least one parameter associated with an environment associated with the first computer, wherein the environment defines a plurality of parameters communicated between the first and second computer as part of the remote session, where each parameter defines an action associated with said remote session; and (b) a second application module to be deployed in the second computer running the remote session, wherein the second application module intercepts communication data from the first computer, and upon detecting a parameter modified by the first application module, extracts the modified parameter, looks up at least one instruction associated with the modified parameter, and executes the pre-defined action, wherein the execution affects the remote session, with the pre-defined action being different than the modified parameter's associated action

CONCLUSION

A system and method has been shown in the above embodiments for the effective implementation of a remote communication system and method between an electronic device and a remote computer. While various preferred embodiments have been shown and described, it will be understood that there is no intent to limit the invention by such disclosure, but rather, it is intended to cover all modifications falling within the spirit and scope of the invention, as defined in the appended claims. For example, the present invention should not be limited by software/program, computing environment, or specific computing hardware.

The above enhancements are implemented in various computing environments. For example, the present invention may be implemented on a conventional IBM PC or equivalent, multi-nodal system (e.g., LAN) or networking system (e.g., Internet, WWW, wireless web). All programming and data related thereto are stored in computer memory, static or dynamic, and may be retrieved by the user in any of: conventional computer storage, display (i.e., CRT) and/or hardcopy (i.e., printed) formats. The programming of the present invention may be implemented by one of skill in the art of remote session programming.

The invention claimed is:

1. A method as implemented in a first application running in an electronic device comprising:

identifying an environment associated with said electronic device, said electronic device remotely controlling, via a second application, a remote session on a remote computer over a first network, said remote controlling performed via a bidirectional communication, and said environment defining a plurality of parameters communicated between said electronic device and said remote computer as part of said remote session, each parameter in said plurality of parameters defining an action associated with said remote session; and

said first application running in said electronic device, via a unidirectional communication with said environment, modifying at least one parameter associated with said environment, said modified parameter extracted by an interceptor associated with said remote computer and, based on a look-up, executing a pre-defined action affecting said remote session, said pre-defined action different than said modified parameter's associated action.

2. The method of claim **1**, wherein said modified parameter involves modification of any of the following: keyboard scan codes, cursor position, mouse position, clipboard data, screen resolution, or channel administration.

3. The method of claim **1**, wherein said first application is any of the following: web application, office productivity application, or a mail client.

4. The method of claim **1**, wherein said modified parameter contains an illegal value with respect to said remote session.

5. The method of claim **1**, wherein said interceptor is implemented as computer readable program code in said remote computer.

6. The method of claim **1**, wherein said first network is a wide area network (WAN).

7. The method of claim **1**, wherein said first network is a cellular network.

8. The method of claim **1**, wherein said interceptor is implemented as computer readable program code in a network device communicating over a second network with said remote computer.

9. The method of claim **8**, wherein said second network is a local area network (LAN).

10. The method of claim **1**, wherein said electronic device is a cellular telephone.

11. A method as implemented in a first application associated with a computer-based device comprising:

identifying an environment associated with said computer-based device, said computer-based device remotely controlling, via a second application, a remote session on a remote computer over a first network, said remote controlling performed via a bidirectional communication, and said environment defining a plurality of parameters communicated between said computer-based device and said remote computer as part of said remote session, each parameter in said plurality of parameters defining an action associated with said remote session; and

said first application running in said computer-based device, via a unidirectional communication with said environment, modifying at least one parameter associated with said environment, said modified parameter extracted by an interceptor associated with said remote computer and, based on a look-up, executing a pre-defined action affecting said remote session, said pre-defined action different than said modified parameter's associated action.

12. The method of claim **11**, wherein said modified parameter involves modification of any of the following: keyboard scan codes, cursor position, mouse position, clipboard data, screen resolution, or channel administration.

13. The method of claim **11**, wherein said first application is any of the following: web application, office productivity application, or a mail client.

14. The method of claim **11**, wherein said modified parameter contains an illegal value with respect to said remote session.

15. The method of claim **11**, wherein said interceptor is implemented as computer readable program code in said remote computer.

16. The method of claim **11**, wherein said first network is a wide area network (WAN).

17. The method of claim **11**, wherein said first network is a cellular network.

18. The method of claim 11, wherein said interceptor is implemented as computer readable program code in a network device communicating over a second network with said remote computer.

19. The method of claim 18, wherein said second network is a local area network (LAN).

20. A method as implemented in a first application running in an electronic device comprising:

identifying an environment associated with said electronic device, said electronic device remotely controlling, via a second application, a remote session on a remote computer over a first network, said remote controlling performed via a bidirectional communication, and said environment defining a plurality of parameters communicated between said electronic device and said remote computer as part of said remote session, each parameter in said plurality of parameters defining an action associated with said remote session;

identifying at least one parameter to be modified and temporarily storing contents associated with said identified parameter in computer storage;

said first application running in said electronic device, via a unidirectional communication with said environment, modifying said identified parameter, said modified parameter extracted by an interceptor associated with said remote computer and, based on a look-up, executing a pre-defined action affecting said remote session, said pre-defined action different than said modified parameter's associated action; and

restoring contents associated with said identified parameter from said computer storage.

21. The method of claim 20, wherein said modified parameter involves modification of any of the following: keyboard scan codes, cursor position, mouse position, clipboard data, screen resolution, or channel administration.

22. The method of claim 20, wherein said first application is any of the following: web application, office productivity application, or a mail client.

23. The method of claim 20, wherein said modified parameter contains an illegal value with respect to said remote session.

24. The method of claim 20, wherein said interceptor is implemented as computer readable program code in said remote computer.

25. The method of claim 20, wherein said electronic device is a cellular telephone.

26. The method of claim 20, wherein said first network is a wide area network (WAN).

27. The method of claim 20, wherein said first network is a cellular network.

28. The method of claim 20, wherein said interceptor is implemented as computer readable program code in a network device communicating over a second network with said remote computer.

29. The method of claim 28, wherein said second network is a local area network (LAN).

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